2006 RESEARCH PROBLEM STATEMENT

Problem Title: Calibration and Validation of I-15 VISSIM model **No.:** 06-05.7

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1. Briefly describe the problem to be addressed:

The purpose of this project is to build, calibrate, and validate VISSIM model of I-15 from SR 201 (or 600 N) to University Parkway. UDOT has started developing a VISSIM microsimulation model for evaluation of the HOT lanes on I-15 from SR 201 to University Parkway. Microsimulation models are required tools for evaluation of HOV and HOT facilities. However, microsimulation models require much more details when building and calibrating the models. The calibration of microsimulation parameters (e.g. car-following parameters, speed and acceleration distributions) is very essential to validate simulations results with the observed performance measures. The proper validation of simulation parameters will enable successful evaluation of the proposed HOT lanes on I-15. Utah Traffic Lab has a lot of experience in building and calibrating VISSIM and VISUM models.

2. List the research objective(s) to be accomplished:

1. Identify the proper calibration methodologies considering various possible scenarios
2. Already complete
3. Compare and evaluate simulated and measured travel variables and make recommendations

3. List the major tasks required to accomplish the research objective(s): Estimated person-hours

1. Develop project scope
2. Prepare brief literature review
3. Propose research methodology (data collection, calibration, validation)
4. Integrate material and data already developed and gathered by UDOT
5. Collect data (UTL - real time connection to the TMS data)
6. Calibrate VISSIM model by using Genetic Algorithm or other optimization searching tools
7. Validate VISSIM model for an independent data set (not used in calibration)
8. Report findings to UDOT **Total of 333 person-hours**
9. Deploy Genetic Algorithm calibration tool in UDOT Planning Division.
10. Note: There is a dollar for dollar match by the MPC.

4. Outline the proposed schedule (when do you need this done, and how we will get there):

Scope and literature review – by June 2006

Methodology and model integration – by September 2006

Data collection and calibration – by January 2007

Data collection and validation – by April 2007

Report, Procedure, Training, and Software to UDOT – by June 2007

5. Indicate type of research and / or development project this is:

Large: ☒ Research Project ☐ Development Project

Small: ☐ Research Evaluation ☐ Experimental Feature ☐ New Product Evaluation ☐ Tech Transfer Initiative：

☐ Other_____

6. What type of entity is best suited to perform this project (University, Consultant, UDOT Staff, Other Agency, Other)?

7. What deliverable(s) would you like to receive at the end of the project? (e.g. useable technical product, design method, technique, training, workshops, report, manual of practice, policy, procedure, specification, standard, software, hardware, equipment, training tool, etc.)

Training, Report, Procedure, Software

8. Describe how will this project be implemented at UDOT.

UDOT Planning and TOC engineers will use the calibrated and validated model for the evaluation of HOV and potentially HOT lanes. They will also be able to use developed software for future calibration of the VISSIM models.

9. Describe how UDOT will benefit from the implementation of this project, and who the beneficiaries will be.

Beneficiaries will be engineers who will use I-15 VISSIM model for evaluation of various car pool policies on the HOV lanes or any other projects that requires VISSIM calibration in future.

10. Describe the expected risks, obstacles, and strategies to overcome these.

11. List the key UDOT Champion of this project (UDOT employee who will help Research Division steer and lead this project, and will spearhead the implementation of the results): Eric Rasband, Michael Kaczorowski

12. Estimate the cost of this research study including implementation effort use person-hours from No. 3： $30, 000(UDOT)

13. List other champions (UDOT and non-UDOT) who are interested in and willing to participate in the Technical Advisory Committee for this study:

Name	Organization/Division/Region	Phone
A)		
B)		
C)		
D)		
E)		
F)		
G)		

14. Identify other Utah agencies, regional or national agencies, or other groups that may have an interest in supporting this study:

The USDOT funded Mountain Plain Consortium will match the UDOT contribution dollar for dollar.